

(No Model.)

4 Sheets—Sheet 1.

L. N. McCARTER.
PICKLING MACHINE.

No. 545,412.

Patented Aug. 27, 1895.

FIG. 1.

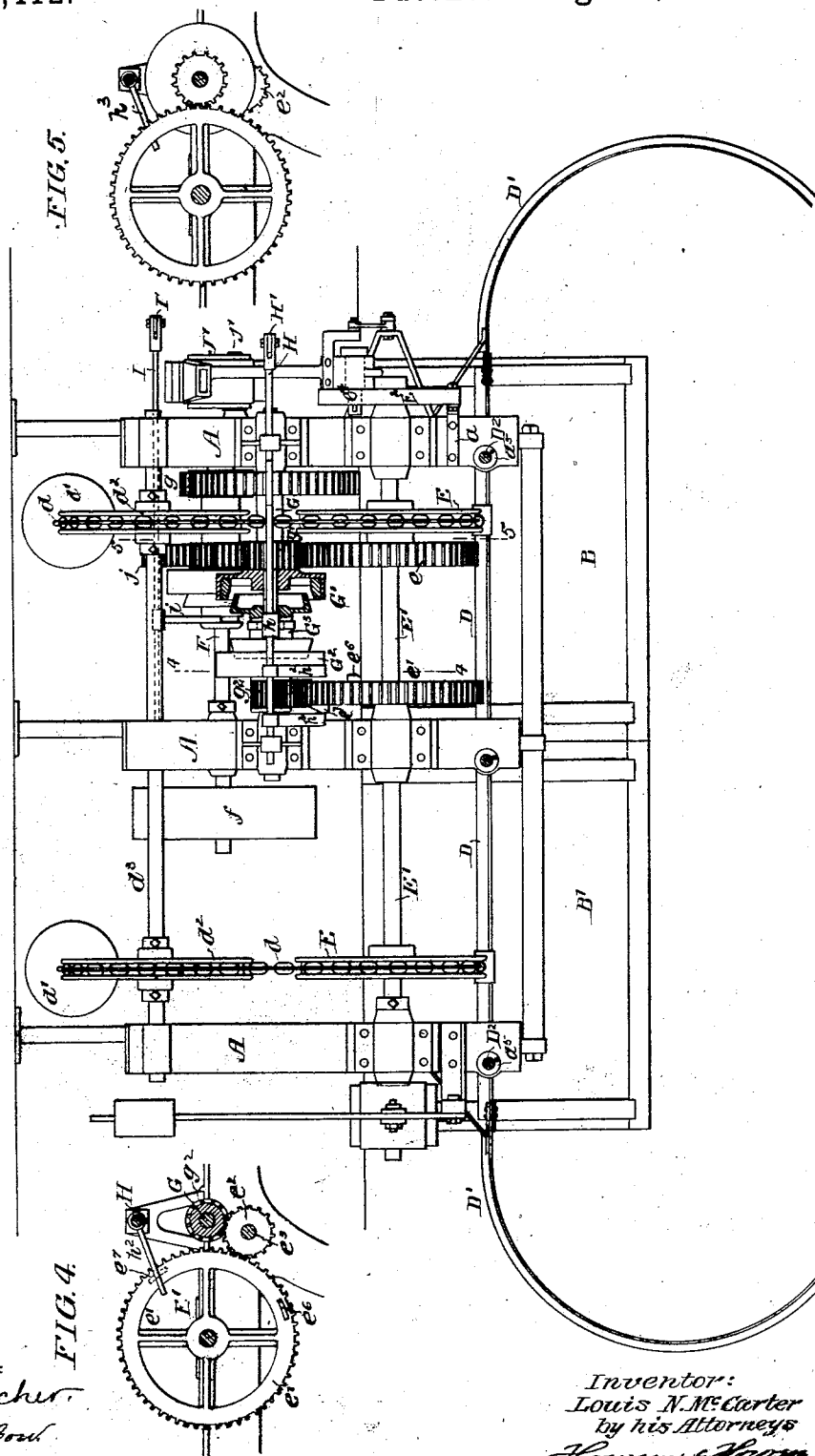


FIG. 4.

Witnesses:
R. Schlicher
Chas. DeGru

Inventor:
Louis N. McCarter
by his Attorneys
Howman & Brown

(No Model.)

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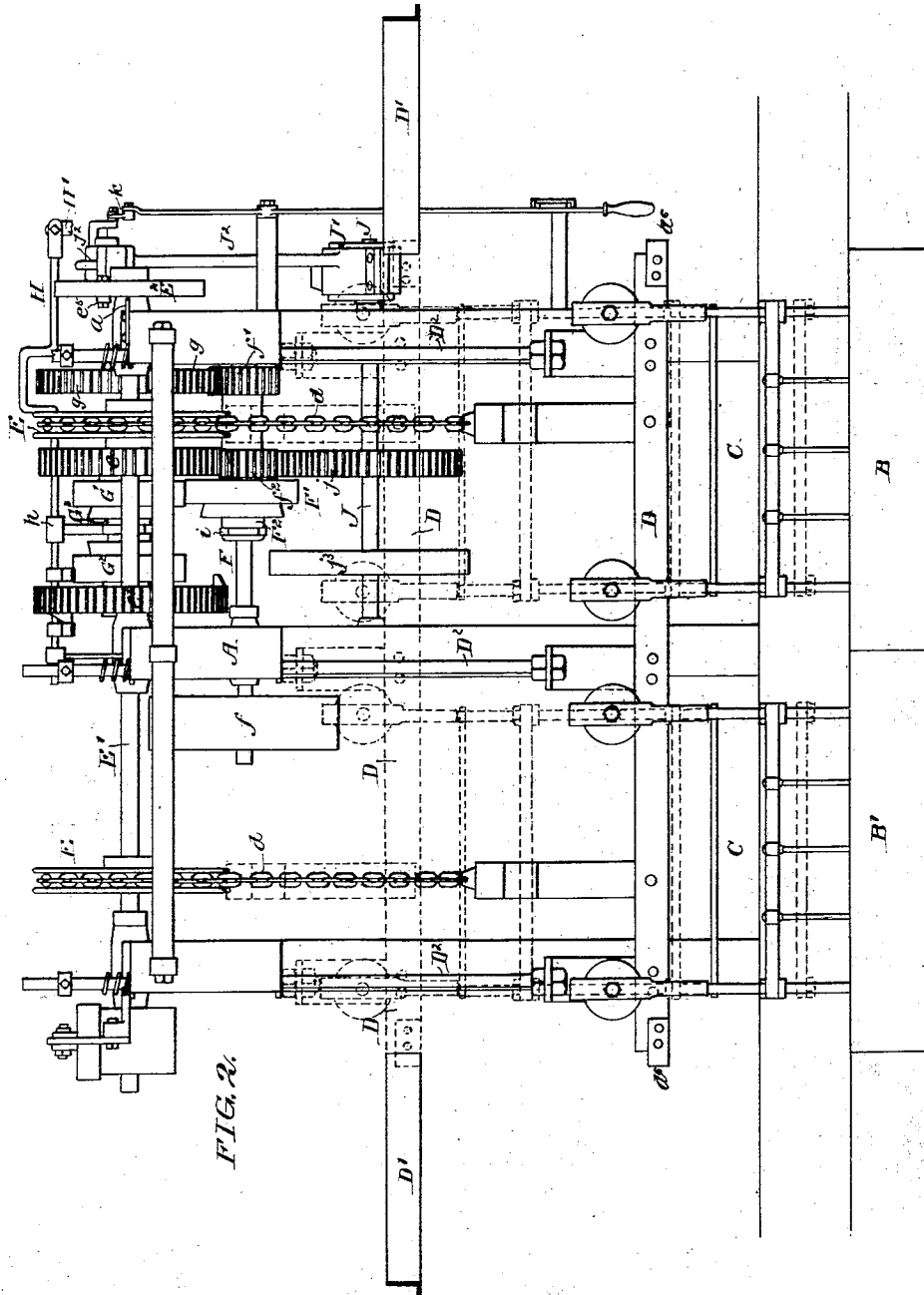


FIG. 2.

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Thos. W. Thomas

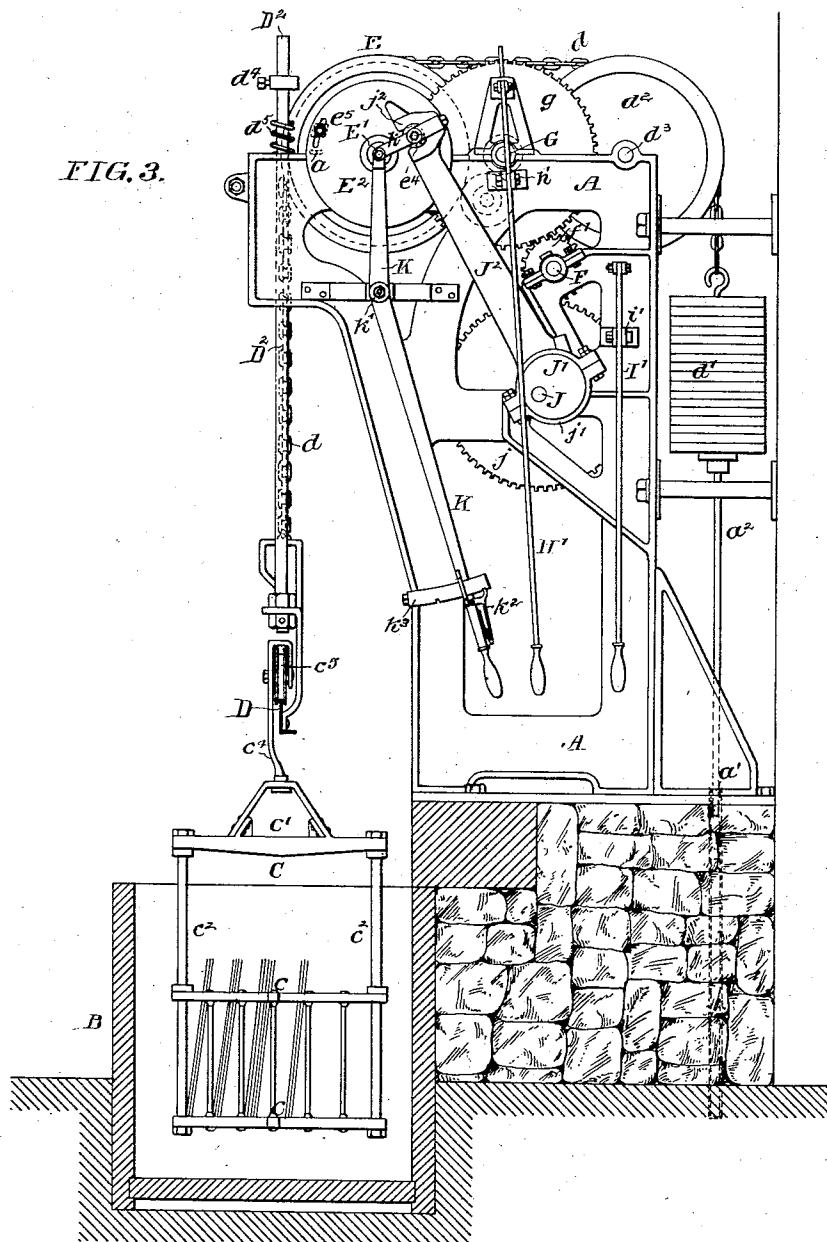
(No Model.)

4 Sheets—Sheet 3.

L. N. McCARTER.
PICKLING MACHINE.

No. 545,412.

Patented Aug. 27, 1895.



Witnesses:

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Inventor:

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Howson & Hornin

(No Model.)

4 Sheets—Sheet 4.

L. N. McCARTER.
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FIG. 7.

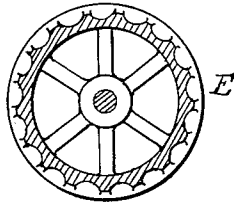
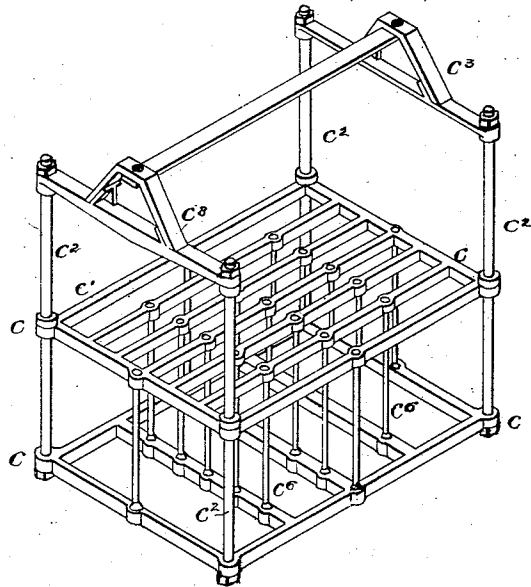


FIG. 6.



Witnesses:

R. Schlicher.
Chas. H. Con.

Inventor:

Louis N. McCarter
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Howe & Howe

UNITED STATES PATENT OFFICE.

LOUIS N. McCARTER, OF NORRISTOWN, PENNSYLVANIA.

PICKLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 545,412, dated August 27, 1895.

Application filed January 18, 1895. Serial No. 535,402. (No model.)

To all whom it may concern:

Be it known that I, LOUIS N. McCARTER, a citizen of the United States, and a resident of Norristown, Montgomery county, Pennsylvania, have invented certain Improvements in Pickling-Machines, of which the following is a specification.

My invention relates particularly to machines for handling black plate during the pickling operation of tin-plate manufacturing.

The main object of my invention is to so construct the machine that the crates for the plates can be shifted from a stationary rail onto the movable rail of the machine and the plates carried by the trays can be immersed in liquor and agitated therein and removed therefrom by mechanism under the control of suitable levers. This object I attain in the following manner, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of my improved machine for pickling-metal plates. Fig. 2 is a front view. Fig. 3 is a side view showing one of the vats in section. Fig. 4 is a section on the line 4 4, Fig. 1. Fig. 5 is a section on the line 5 5, Fig. 1; and Fig. 6 is a perspective view of one of the crates. Fig. 7 is a view in section through the rim of one of the pocket-wheels.

A is the frame of the machine.

B B' are the vats, two in the present instance.

D is the removable rail suspended from the machine and when in the raised position, as shown by dotted lines in Fig. 2, aligns with the fixed rail D', extending through the factory building, so that the trays C, which are suspended from the rails, can be moved from one point to the other of the factory loaded, dipped, and unloaded, requiring very little manual labor.

The crates in the present instance consist of the platform *c*, the frame *c'*, and the two heads *c³* *c³*. Vertical standards *c²* at each corner connect the frame to the platform, and each pair of standards carry a head *c³*, and adapted to each head is a hanger *c⁴*, having a wheel *c⁵*, adapted to the rail. It will be understood that other forms of crates may be used without departing from my invention.

In this crate the plates are arranged on end,

as shown in Fig. 3, on the platform and extend up through the frame *c'*, so that a number of plates can be immersed at once. The rail D is attached to two chains *d*, in the present instance, and each chain has a counterbalance-weight *d'*, which passes over a driven pocket-wheel E and a plain wheel *d²*. The former is mounted on a driving-shaft E' and the latter on the shaft *d³*. Both shafts are adapted to bearings in the frame A of the machine.

The mechanism which I will describe hereinafter is so constructed that when one of the crates is moved onto the rail D from the fixed rail D', and a lever operated, the rail with the crate is lowered, so as to allow the crate to enter one of the vats B B'. Then by throwing out the lever and throwing in another lever the crate is given a vertical reciprocating motion in the vat, so as to keep the liquid therein in constant agitation. After the crate has been in the vat a certain length of time another lever is shifted, which raises the rail D to its normal position in line with the rail D' and removes the tray from the vat.

The mechanism for imparting the above-described motion is constructed as follows: F is the driving-shaft, having a belt-pulley *f*, and on this shaft is secured a pinion *f'*, gearing with a wheel *g*, fixed on an intermediate shaft G. Loose on the shaft G are two pinions *g'* *g²*. The pinion *g'* carries one part of a friction-clutch G', and the pinion *g²* carries one part of the friction-clutch G². The other part of each clutch, in the present instance, is carried by a hub G³, splined to the shaft G, so that it will slide on but turn with the shaft. H is a shifter-rod, having a fork *h* engaging with the hub G³. This shifter-rod H is controlled by a lever H', pivoted at *h'* at the side of the machine, so that by operating the lever the hub G³ can be thrown into engagement with either of the friction-clutches G' or G², or can be moved midway between the two, as shown in the drawings. The pinion *g'* meshes directly with the gear-wheel *e* on the shaft E', while the pinion *g²* meshes indirectly with a wheel *e'* through an intermediate pinion *e²* on a stud *e³*, projecting from the frame of the machine, as clearly illustrated in Fig. 4, so that when the shaft E' is in gear with the shaft G through the wheels *e* *g'* the crates will be ele-

vated by the mechanism, and when the clutch-hub is thrown over, so as to place the shaft E' in gear with the shaft G through the train of wheels e' , e^2 , and g^2 , the shaft E' will be reversed and the crates lowered. Loose on the driving-shaft F is a pinion f^2 , carrying one section of a friction-clutch F', the other section being carried by a hub F², splined to the shaft, so that it will turn with but slide thereon. This hub is controlled by a shifter-rod I, having a fork i engaging with the hub.

I' is a lever pivoted at i' to the frame of the machine at the side thereof and connected to the shifter I, so that on operating the lever the hub F² can be thrown into and out of contact with the section carried by the pinion f^2 . This pinion f^2 meshes with a gear-wheel j , secured to a shaft J, mounted in bearings in the frame. On the end of this shaft is an eccentric J'.

J² is an eccentric-rod having a strap j' , encircling the eccentric J', and the opposite end of the eccentric-rod has a hook j^2 , adapted to engage the pin e^4 on a disk E², secured to the shaft E', so that when the eccentric-shaft is in gear with the driving-shaft and the eccentric-rod hooked onto the pin of the disk E², the shaft E' will be given a rocking motion, causing the crates to rise and lower in the vats and thus agitate the liquor, thus insuring the proper treatment of the plates while in the liquor.

In order to throw the eccentric-rod out of engagement with the pin of the disk E², I connect the hooked end of the rod by a link k to one arm of a lever K, pivoted at k' to a stud on the side of the machine. The handled end of the lever is preferably provided with a spring-pawl k^2 , which is adapted to notches in a segment k^3 , fixed to the side of the machine. As shown in Fig. 3, the eccentric-rod is in engagement with the pin of the disk E² and the shaft E' is not in gear with the intermediate shaft G, so that the agitating motion is given to the crates. I preferably arrange a stop a on the frame of the machine and a lug e^5 on the disk E², which is adjustable in a slot in said disk, so that the stop will limit the downward movement of the crates, and I also provide dash-pots a' , into which extend the plungers a^2 from the counterbalance-weights d' , so that the trays when elevated will not come to a sudden stop.

On the shifter-rod H are two arms h^2 h^3 , and on the wheel e' are lugs e^6 e^7 . As the crates are lowered into the vats and when they reach the lowermost point, the lug e^7 strikes the shifter-arm h^3 and shifts the clutch-hub, so as to throw the shaft E' out of gear with the intermediate shaft G, and when the crates are elevated to their extreme position, so that the rail D will align with the rail D', the lug e^6 strikes the shifter-arm h^2 , throwing the shaft E' out of engagement with the shaft E. It will thus be seen that a careless operator cannot injure the machine to any great

extent. By counterbalancing the crates, as shown, very little power is required to operate the machine. I preferably mount a fly-wheel j^3 on the shaft J, so as to carry the eccentric over the center.

I prefer to make the crates as shown in Fig. 6. They are preferably made of copper and the platform c has cross-bars, while the frame c' has longitudinal bars, and connecting the bars of the platform to the bars of the frame are vertical bolts c^6 , riveted in position, these bolts serving to hold the parts together, at the same time acting as partitions for the plates, as shown in Fig. 3.

The operation of the machine is as follows: When the rail D is elevated, as shown by dotted lines in Fig. 2, it aligns with the rail D', and a crate loaded with plates is pushed onto the rail D and the lever H' is shifted so as to allow the rail D to lower to the position shown in Fig. 3. The stop a will limit the downward movement and a shifter will be automatically thrown so as to release the shaft E' from the control of the shaft G. The eccentric-rod is then thrown into gear, as shown in Fig. 3, by the lever K, and the lever I' throws the eccentric-shaft J in gear with the driving-shaft, so that a vertical reciprocating motion is given to the crate in the vat to agitate the liquor therein and to cause it to come into contact with all parts of the plate. When the plates have been in the liquor a certain length of time, the eccentric-shaft is thrown out of gear and the eccentric-rod is moved out of contact with the pin on the disk E². The lever H' is then moved to such a position that the shaft E' is thrown into gear with the shaft G through the return gear, so as to elevate the rail D and the crate clear of the vat and in line with the rail D'. The first vat B is the pickling-vat, while the second vat is the rinsing-vat, and when the crate is removed from the first vat it is traversed on the rail until above the second vat, when another crate of plates is shifted onto the rail and the above described operation is repeated, one tray being in the pickling-vat while the other tray of plates is being cleansed. In order to stay the rail D, I connect it to a series of rods D²—three in the present instance—which pass through openings in the frame A of the machine and have at their upper ends adjustable stops d^4 , and between the stops and the frame I preferably mount spring-buffers d^5 to take up the shock and thus relieve the stop a when the rail is lowered. Stops d^5 on the rail D come in contact with the rail D' when it is elevated.

I claim as my invention—

1. The combination of the vat, a frame, a fixed rail, a movable rail adapted to register with the fixed rail, a chain by which the movable rail is suspended, a shaft having a wheel over which the chain passes, a driven shaft geared to said wheel, shifting mechanism so arranged that the movable rail, can be

raised or lowered and mechanism for vertically reciprocating the rail when lowered, substantially as described.

2. The combination of a vat, a frame, a fixed rail and a movable rail, a chain by which the movable rail is suspended, a counterbalance for the rail, a crate adapted to the rails, a driving shaft, a driven shaft, a chain wheel thereon over which the chain passes, two sets of gears and clutches through which motion is imparted from the driving shaft to the driven shaft, with means for shifting the clutches so as to raise or lower the movable rail with the crate, substantially as described.

3. The combination of the vat, a crate, the vertically movable rail, chains by which the rail is suspended, counterbalance weight on the end of each chain, a driven shaft, wheels thereon engaging with the chains, a driving shaft, an intermediate shaft, two clutches on said shaft, one clutch being connected to the driving shaft through one train of gears and the other clutch geared to the driven shaft through another train of gears, and mechanism for operating the clutches so that when one clutch is in gear the rail will be raised and when the other clutch is in gear the rail will be lowered, substantially as described.

4. The combination in a machine for pickling plates, of the vat, the crate, the movable rail, chains supporting said rail, a driven shaft having wheels engaging with the chain, means for raising and lowering the rail through the medium of the shaft, a crank pin

on said shaft an eccentric and an eccentric rod engaging with the pin, and means for driving said eccentric so that the crate immersed in the liquor will have a reciprocating motion, substantially as described.

5. The combination of the vat, the crate, the movable rail, chains supporting said rail, a counterbalance for the crate, a driving shaft and a driven shaft, a wheel on said driven shaft engaging with the chains, friction clutches through which motion is imparted from the driving shaft to the driven shaft, a lever for shifting the clutches, an eccentric and eccentric rod, a disk on the driven shaft having a pin with which the eccentric rod engages, a shifter for throwing the eccentric into and out of gear with the driving shaft, and a lever for disconnecting the eccentric rod from the pin, substantially as described.

6. The combination in a crate for pickling machines, of the platform having transverse bars, the frame having longitudinal bars, rivets or bolts extending from the platform to the frame at the points where the bars cross, and means for suspending the crates in the liquor, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LOUIS N. McCARTER.

Witnesses:

WILL. A. BARR,
FRED C. BENNER.

It is hereby certified that Letters Patent No. 545,412, granted August 27, 1895, upon the application of Louis N. McCarter, of Norristown, Pennsylvania, for an improvement in "Pickling-Machines," were erroneously issued to said inventor as owner of the entire interest in the invention; that said Letters Patent should have been issued to *said McCarter and John D. Newbold, jointly*, said Newbold being owner of one-third interest as shown by assignments of record in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 10th day of September, A. D. 1895.

[SEAL.]

JNO. M. REYNOLDS,
Assistant Secretary of the Interior.

Countersigned:

S. T. FISHER,
Acting Commissioner of Patents.